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EOSDIS Core System Project

Interface Control Document for ECS Interfaces That Support External Subsetters Located at DAACs

November 2001

Raytheon Company
Upper Marlboro, Maryland

Interface Control Document for ECS Interfaces That Support External Subsetters Located at DAACs

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Preface

This document is a formal contract deliverable with an approval code 1. It requires Government review and approval prior to final contract acceptance. This document is under ECS contractor configuration control. Contractor approved changes are handled in accordance with the change control requirements described in the EOS Configuration Management Plan. Changes to this document will be made by document change notice (DCN) or by complete revision.

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Abstract

Multiple appliances to subset HDF-EOS data granules from the ECS archives may be located within any DAAC. ECS support of external subsetting appliances located at the same DAAC as the ECS requires a number of interfaces. This document defines these interfaces as well as specialized data formats that must be applied to the ODL messages flowing across a number of the interfaces.

Keywords: EDG, HDF-EOS, ODL, Registry, Subsetter, V0 Gateway

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1. Introduction

1.1 Identification

This Interface Control Document (ICD), Contract Data Requirements List (CDRL) item 029, whose requirements are specified in Data Item Description (DID) 209/SE1, is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) Contract (NAS5-60000).

1.2 Scope

This document is the design specification for the various interfaces at a DAAC between generic subsetting appliances external to the ECS and the ECS at the same DAAC. Configurable information for a specific subsetting appliance and DAAC will be found in operational documents for the specific DAAC.

Related information about other interfaces on which the ECS-Subsetter interfaces are dependent is also included.

This document does not include Release or Drop schedules. Information about schedules for implementation of ECS external Subsetter interfaces is contained in the Synergy Program Schedule.

1.3 Purpose

This document is written to formalize the interpretation and general understanding of the interfaces between external subsetting appliances and the ECS. This document provides clarification and elaboration of those interfaces to the extent necessary to assure hardware, software, and operational service compatibility within the end-to-end system.

1.4 Status and Schedule

This document specifies interfaces to support the planned external subsetter functionality. Not all interfaces described herein will be supported initially or by all subsetter installations.

This ICD is submitted as a final ECS Project Configuration Control Board (CCB) approval Code 1 document. It includes, as an appendix, a work-off plan which tracks open items that may not be completed until after the document is baselined.

This document will eventually be designated to be under full Government CCB control. Changes may be submitted at any time for consideration by Contractor and Government CCBs under the normal change process.

1.5 Organization

Section 1 provides information regarding the identification, scope, purpose, status and schedule and organization of this document.

Section 2 lists parent documents and related documents.

Section 3 is an overview of the interfaces specified in this document.

Section 4 provides specifications for a subsetter-supplied tool required to determine subsetter-specific subsetting characteristics by data type for storage in the ECS.

Section 5 describes interfaces between the EDG and the V0 Gateway with special attention to how subsetting options and selections are embedded in ODL messages.

Section 6 contains specifications for the product request message sent to the subsetter and for the subsetter's response .

Section 7 summarizes the standard messages used for the subsetter to order granules to be subsetted from the ECS.

Section 8 is a summary of how ECS delivers the input data ordered by the subsetter.

Section 9 explains the polling with delivery record interface that the subsetter uses if it exercises the option to provide subsetted data for distribution by the ECS.

Section 10 summarizes ECS distribution options.

Section 11 gives the specifications for messages by which the subsetter provides order status to the ECS.

Appendix A is a work-off plan for open topics or issues.

Appendix B defines certain ODL keywords supported by the ECS for External Subsetter interfaces only.

Appendix C lists configurable parameters and other information that the Subsetter provider and Operations personnel should agree on in advance of subsetting operations.

2. Related Documentation

The latest versions of all documents below should be used. The latest ESDIS Project documents can be obtained from URL: http://spsosun.gsfc.nasa.gov/ESDIS_Pub.html . ESDIS documents have a document number starting with either 423 or 505. The latest EOSDIS Core System (ECS) documents can be obtained from URL: http://edhs1.gsfc.nasa.gov/.

2.1 Parent Documents

The parent document is the document from which this interface control document's scope and content are derived.

423-41-01 ECS Statement of Work

423-41-02 Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS)

2.2 Applicable Documents

The following documents are referenced within this interface control document, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this volume.

505-41-30 Interface Control Document Between EOSDIS Core System (ECS) and the Version 0 System for Interoperability

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3. Overview

3.1 Introduction

This document is the specification for ECS external interfaces that support subsetting of granules from the ECS archives by various external subsetting appliances. It is limited to subsetting appliances that are collocated with the ECS at a DAAC. Detailed specifications are given for interfaces between the ECS and the Subsetter. Also included are interfaces between the ECS and the EDG (or other V0 client for ordering ECS data) in order to document how special subsetting options specific to each granule eligible for subsetting are translated from the ECS Registry into ODL.

Some of the functionality documented herein is optional for the subsetter. For example, this document includes the interfaces needed for the case when ECS distributes the subsetted data for the subsetter. Not all subsetters use this service.

The user of this ICD should be thoroughly familiar with the V0 protocol as specified in the ECS-V0 ICD. With a few exceptions, which are noted, the ODL messages and keywords used in these interfaces are a subset of those defined in the ECS-V0 ICD. Explanations of protocol or values are given where subsetter-specific information is needed.

3.2 Interface Summary

Figure 3-1 is a summary of the interfaces addressed in this interface control document.

Before the ECS can support an external subsetter, the Registry must be populated with the subsetter's characteristic information. The subsetter provides a subsetter characterization tool (1) which the DAAC can use to define subsetting options offered by that subsetter for each candidate data type. This information can also be obtained through offline analysis and entered in the Registry manually.

The EDG (or another V0 client) sends an Inventory Search Request message (2) to the ECS V0 Gateway. The Gateway sends an Inventory Search Result message (3) containing subsetting options back to the EDG for display of the options to the user. The user selects subsetting options and the EDG forwards a Product Request message (4) containing the user's subsetting selections back to the V0 Gateway.

The V0 Gateway separates requests for granules in the archive from subsetting requests and forwards the former through the ECS for order fulfillment, but uses Product Request messages (5) to send subsetting requests to the appropriate subsetter(s) identified by the ECS Registry for the granules ordered. The subsetter validates the request and returns a Product Result message (6) confirming or rejecting the subsetting request. The V0 Gateway sends a Product Result covering the entire order (7) to the EDG.

If the subsetter accepts the request, it orders the input data needed from the ECS archives by sending a standard Product Request (8) message to the V0 gateway. The V0 Gateway responds with a Product Result Message (9). The association of this order to the original subsetting request is invisible to the ECS.

The ECS ftp's the requested data (10) with metadata files to the location provided in the Subsetter's Product Request and sends a standard e-mail distribution notice (11) to notify the subsetter that the data is in the directory.

At specified points during this process, the subsetter furnishes order status to the ECS in Order Status Update messages (12) and the Gateway responds to each with an Order Status Acknowledge message (13).

Some subsetters may distribute the subsetted data directly to the user, providing an Order Status Update message with status Shipped to the Gateway. Otherwise, the subsetter forwards subsetted data and other related files to the ECS for distribution, using a polling with delivery record methodology (14, 15). The ECS then distributes the data to the user as defined in the Product Request.

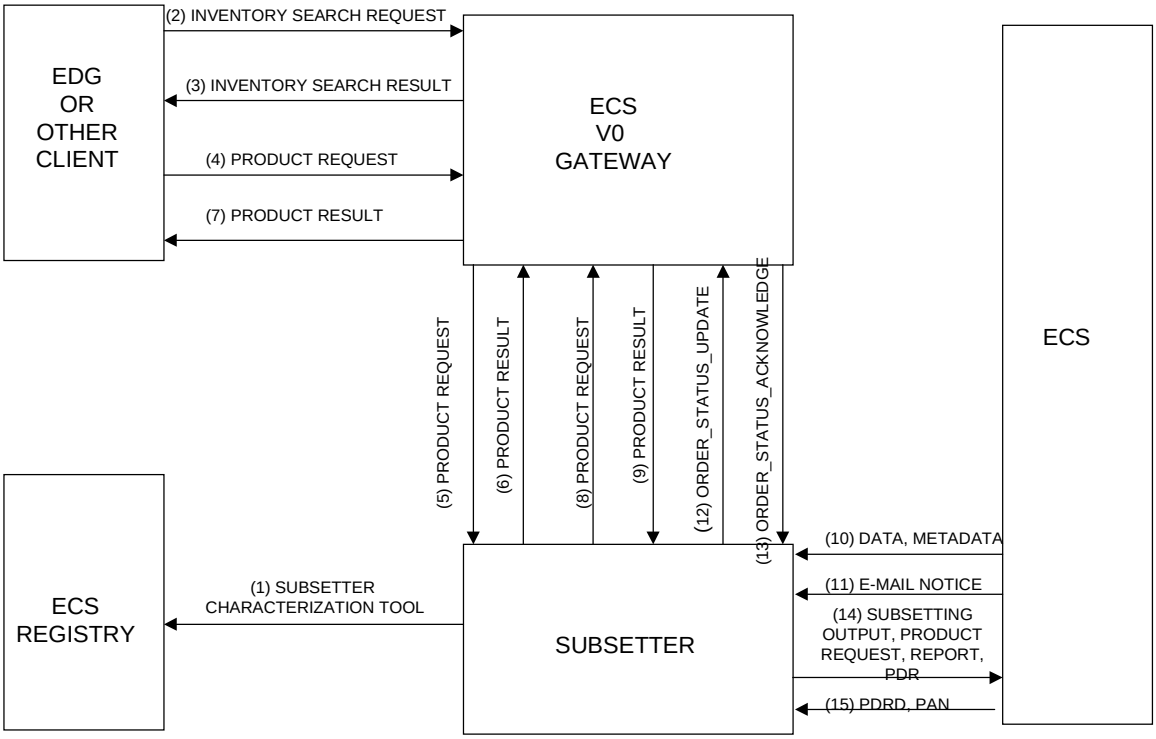

Figure 3-1. Summary of Subsetter-Related External Interfaces

3.3 Communications

Transmission Control Protocol (TCP) and Internet Protocol (IP) will be used for transport of the ODL messages described. E-mail will be utilized where specified (for ECS distribution notices in particular) and File Transfer Protocol for transfer of files between the Subsetter and ECS.

Interface-unique topology and configurable information for a specific subsetter and DAAC should be recorded in DAAC-specific operational documents.

3.4 Security

Each external subsetter is located behind the DAAC firewall with the ECS. With respect to system security, the Subsetter is managed like another element of the ECS. If the Subsetter has other external interfaces (for example, web pages that are accessed by users), the subsetter implements any additional required security features.

3.5 ODL Conventions

The following conventions for representing ODL statements are observed in the ECS-V0 ICD and are applied in this document.

- keywords are words that have a special meaning in ODL, itself, and are treated as instructions
- all keywords are printed in CAPS
- items in square brackets ([ ]) are options
- items in parentheses (...) indicate that these items may be repeated any number of times
- after the parentheses (...) a single character is given that tells how many occurrences are allowed; i.e.,

  - '*' means zero or more occurrences

  - ‘+’ means one or more occurrences
- a vertical bar between items means "or"
- Each group is further defined down to its keyword components

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4. Interface between the Subsetter and the ECS Registry - TBD

Before ECS can support an external subsetter, data about subsetting characteristics must be obtained from the subsetter and entered in the ECS Registry. For each earth science data type (ESDT) that is a candidate for subsetting, the registry records which subsetter(s) can process that ESDT and defines the subsetting options that the subsetter(s) offers.

Each Subsetter supplies a tool that the DAAC staff can run against examples of candidate ESDTs to determine whether granules of that ESDT can be subsetted by the subsetter and which subsetting options the subsetter can offer for that ESDT. This subsetter characteristics output can be further processed by ECS tools for storage in the Registry. The ECS V0 Gateway extracts subsetter characteristics information and includes it in Inventory Search Result messages to V0 clients for display to the user as options.

This interface will be defined and descriptions of subsetter support capabilities will be provided in a future revision of the ICD.

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5. Interface Between the ECS V0 Gateway and the EDG Client

This specification is equally applicable to EDG-V0 Gateway interfaces and interfaces with other clients that may order subsetted data granules from the ECS using V0 protocol. Figure 5-1 is a summary of the interfaces addressed in this section. Although the Subsetter interface does not appear in the figure, these data flows are in this ICD because the ODL interface between ECS and the Subsetter is dependent on them.

The ODL keywords and messages in this section are a subset of those specified in the ECS-V0 ICD.

5.1 Inventory Search

A science user uses the EDG client to search for granules to be subsetted. The client sends a standard V0 ODL inventory search request to the ECS V0 Gateway, as specified in the ECS-V0 ICD.

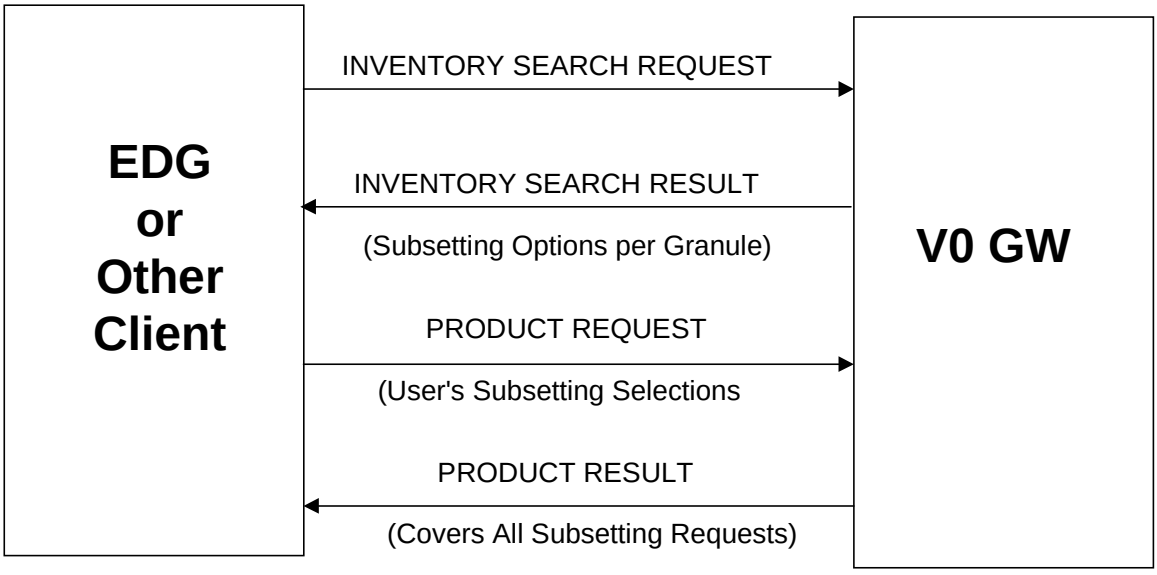

Figure 5-1. V0 Gateway-EDG Data Flows

5.2 Inventory Search Result

The ECS forwards an ODL Inventory Search Result that includes for presentation by the client, available granule-specific subsetting options for each product. See Table 5-1 for the subsetting

options. The full ODL normalization form for the Inventory Search Result can be found in the ECS-V0 ICD. Keywords used in the Inventory Search Result are defined in Appendix A of that document.

Table 5-1. Subset Options in Inventory Search Result (1 of 2)

ODL KEYWORD/GROUP	Type/Length	Comment
SUBSET_OPTIONS group ::==		
SPECIALIZED_CRITERIA group ::==		
[COMMENT]	String, 60	
[CRITERIA_DEFAULT]	Sequence (real, data or integer), 30	If CRITERIA_DEFAULT_FROM_PSA is not present then this may be present. Type must match value for CRITERIA_TYPE.
[CRITERIA_DEFAULT_FROM_PSA]	String, 80	Contains Name of the PSA from which to obtain the default. If CRITERIA_DEFAULT is not present then this may be present
[CRITERIA_MAX]	Real, date or integer, 30	Used to supply temporal subsetting restriction. If neither CRITERIA_MAX_FROM_CORE nor CRITERIA_MAX_FROM_PSA is present and RANGE is present then mandatory. Type must match value for CRITERIA_TYPE.
[CRITERIA_MAX_FROM_CORE]	String, 80	Used to supply temporal subsetting restriction. Contains Name of the Core attribute from which to obtain the maximum. If neither CRITERIA_MAX nor CRITERIA_MAX_FROM_PSA is present and RANGE is present, then mandatory.
[CRITERIA_MAX_FROM_PSA]	String, 80	Used to supply temporal subsetting restriction. Contains Name of the PSA from which to obtain the maximum. If neither CRITERIA_MAX nor CRITERIA_MAX_FROM_CORE is present and RANGE is present then mandatory
[CRITERIA_MIN]	Real, date or integer, 30	Used to supply temporal subsetting restriction. If neither CRITERIA_MIN_FROM_CORE nor CRITERIA_MIN_FROM_PSA is present and RANGE is present then mandatory. Type must match value for CRITERIA_TYPE.
[CRITERIA_MIN_FROM_CORE]	String, 80	Used to supply temporal subsetting restriction. Contains Name of the core attribute from which to obtain the minimum. If neither CRITERIA_MIN nor CRITERIA_MIN_FROM_PSA is present and RANGE is present, then mandatory.

Table 5-1. Subset Options in Inventory Search Result (2 of 2)

ODL KEYWORD/GROUP	Type/Length	Comment
[CRITERIA_MIN_FROM_PSA]	String, 80	Used to supply temporal subsetting restriction. Contains Name of the PSA from which to obtain the minimum. If neither CRITERIA_MIN nor CRITERIA_MIN_FROM CORE is present and RANGE is present then mandatory.
CRITERIA_NAME	String, 80	
CRITERIA_TYPE	String, 7	Possible values: STRING, REAL, INTEGER, DATE, GEO, FIXED
[CRITERIA_VALUE]	Sequence (Real, date or Integer), String	If CRITERIA_VALUE_FROM_PSA is not present and RANGE not present then mandatory.
[CRITERIA_VALUE_FROM_PSA]	String, 80	Contains Name of the PSA from which to obtain the value
DEFAULT	String, 1	Y|N
[MAX_LEN]	Integer, 5	
[RANGE]	Symbol, 1	Y|N Y indicates User must supply min and max values.
[REQUIRED]	Symbol, 1	Y|N Y Indicates User must supply value(s)
SEARCH_CATEGORY	Integer, 3	
[SELECT_NUM]	Symbol, 4	ONE|MANY Indicates whether one or many values must be selected from a set of alternatives (in CRITERIA_VALUE)
[VALIDATE]	Symbol, 1	Y|N If VALIDATE = Y, EDG validates for temporal subsetting. User-entered value must fall within the min/max range. If VALIDATE = N, user-entered value is not range-validated. Default is Y. EDG does not validate for spatial subsetting.

Figure 5-2 illustrates how subsetting options are furnished in SPECIALIZED_CRITERIA groups within the SUBSET_OPTIONS group.

The V0 Gateway furnishes a Granule_Size SPECIALIZED_CRITERIA group. If the V0 Gateway places multiple Package IDs in a single Line Item, it totals their granule sizes. CRITERIA_TYPE "FIXED" indicates that the Granule_Size SPECIALIZED_CRITERIA group is passed back to the V0 Gateway in the Product Request with the CRITERIA_VALUE unchanged.

The V0 Gateway furnishes a SPECIALIZED_CRITERIA group for temporal extent, which contains CRITERIA_MIN_FROM_CORE and CRITERIA_MAX_FROM_CORE to specify the core metadata attributes from which the EDG takes the temporal range limits. The user's temporal range entry will be validated only if VALIDATE = Y is included in the group.

A Parameter SPECIALIZED_CRITERIA group furnishes the list of parameters that can be temporally or spatially subset for this data type.

The Also Include SPECIALIZED_CRITERIA group provides a list of parameters that can be included in the result but cannot be subset.

For CRITERIA_TYPE GEO, the EDG extracts and displays the spatial extent of the granule without prompting the user.

```
GROUP = SUBSET_OPTIONS

        GROUP = SPECIALIZED_CRITERIA
                CRITERIA_NAME = "Granule_size"
                CRITERIA_TYPE = "FIXED"
                CRITERIA_VALUE_FROM_PSA = (
                        "SizeMBECSDataGranule")
        END_GROUP = SPECIALIZED_CRITERIA

        GROUP = SPECIALIZED_CRITERIA
              RANGE = Y
              VALIDATE = "Y"
              CRITERIA_NAME  = "Temporal"
              CRITERIA_TYPE    = "DATE"
              CRITERIA_MIN_FROM_CORE = "START_DATE"
              CRITERIA_MAX_FROM_CORE = "STOP_DATE"
              COMMENT = " Date and Time Range"
        END_GROUP = SPECIALIZED_CRITERIA

        GROUP = SPECIALIZED_CRITERIA
                SELECT_NUM  = MANY
                CRITERIA_NAME = "Parameter"
                CRITERIA_TYPE  = STRING
```

Figure 5-2. Examples of SUBSET_OPTIONS in Inventory Search Result Message (1 of 2)

```
            CRITERIA_VALUE  = (
                  "Solar Zenith Angle",
                  "Satellite Zenith Angle",
                  "Surface Emissivity",
                  "Base Pressure",
                  "Derived Effective Base Temperature",
                  "Derived Effective Base Emissivity",
                  "Surface Indicator",
                  "DEM Altitude",
                  "Num Pixels Aggregate",
                  "Aggregate Bounds",
                  "Cloud Description",
                  "CH4 Total Column",
                  "CO Total Column",
                  "CO Mixing Ratio")
            COMMENT = "Parameters available to be subset"
      END_GROUP    = SPECIALIZED_CRITERIA

      GROUP = SPECIALIZED_CRITERIA
            SELECT_NUM  = MANY
            CRITERIA_NAME = "Also_include"
            CRITERIA_TYPE  = STRING
            CRITERIA_VALUE  = (
                "Wavelengths",
                "Pressure_Level_Range")
            COMMENT = "List of Data Fields that may be selected to be included but not subset."
      END_GROUP    = SPECIALIZED_CRITERIA

      GROUP = SPECIALIZED_CRITERIA
            CRITERIA_NAME = "Spatial"
            CRITERIA_TYPE = "GEO"
            CRITERIA_VALUE = ("BY_RANGE_LOC")
      END_GROUP = SPECIALIZED_CRITERIA

END_GROUP = SUBSET_OPTIONS
```

Figure 5-2. Examples of SUBSET_OPTIONS in Inventory Search Result Message (2 of 2)

5.3 Product Request

The Product Request from the client to the ECS V0 Gateway transmits the subsetting options selected by the science user on the EDG GUI. The Product Request can include requests both for archived data granules and for subsetting multiple granules. The V0 Gateway separates requests for unsubsetted archived granules from subsetting requests. Subsetting line items are allocated to requests by media, subsetter and subsetting options. The gateway forwards the granule requests to the SDSRV and forwards subsetting requests to the appropriate Subsetter. The latter interface is defined in Section 6.

The subsetting selections are specified in the SUBSET_SPEC group. The ODL form for the Product Request is identical for the Client-to-V0 Gateway and V0 Gateway-to-Subsetter interfaces. It is given in Table 6-1. Some examples of subsetting specifications are given in Figure 6-2.

Keywords used in the Product Request are defined in Appendix A of the ECS-V0 ICD.

5.4 Product Result

After the V0 Gateway receives a Product Result from the Subsetter, it updates the MSS Order Tracking database from Null to Pending or to Aborted, depending on the status provided by the Subsetter (see Section 6). When the V0 Gateway has collected status for all requests in an order, it returns status to the client in a standard Product Result message (Table 5-2). The message gives status of all individual line items. Failure of a subsetting request does not result in failure of the rest of the order.

Table 5-2. Product Result Returned to EDG by V0 Gateway (1 of 2)

ODL KEYWORD/GROUP	Type/Length	Comment
PRODUCT_RESULT group ::==		
MESSAGE_ID	String, 30	
DATA_CENTER_ID	Sequence String, 85	
STATUS_CODE		If the order is successful or partially successful, the code is 01. See the REQUEST_RESULT groups for success or failure of each request on the order.
[STATUS_CODE_COMMENT]		If an order is partially successful (01), the comment must be "PARTIAL SUCCESS". A comment must be provided when STATUS_CODE = 99.
DAAC_CONTACT_ADDRESS group		This is a single group only. It contains the ECS Order ID (keyword DAAC_ORDER_ID).
MONITOR group		
[VERSION group]		
(MISC_URL group)*		
(REQUEST_RESULT group)*		A unique Request Result is included for each Request ID in the ECS order. Note: An order might fail before a request ID is generated, in which case no Request Result would be included.
REQUEST_RESULT group::==		Each REQUEST_RESULT group contains the status information for one Request ID
STATUS_CODE	Integer, 4	For a subsetting request, contains the

ODL KEYWORD/GROUP	Type/Length	Comment
		STATUS_CODE value furnished in the Product Result from the Subsetter (Section 6.2). If this value is anything other than 01, the request is Aborted in the MSS Order Tracking database

Table 5-2. Product Result Returned to EDG by V0 Gateway (2 of 2)

ODL KEYWORD/GROUP	Type/Length	Comment
[STATUS_CODE_COMMENT]	Sequence String, 256	For a subsetting request, this contains the STATUS_CODE_COMMENT furnished in the Product Result from the Subsetter (Section 6.2)
(MISC_URL group)*		If the DAAC allows users to interact directly with the subsetting appliance to obtain order status, this contains the URL information furnished in the MISC_URL group in the Product Result from the Subsetter (Section 6.2)
DAAC_REQUEST_ID	String, 30	ECS Request ID
LINE_ITEM group		Contains the LINE_ITEM group for the Request as obtained from the original Product Request returned by the EDG.

The ODL normalization form for the Product Result can be found in the ECS-V0 ICD. Keywords used in the Product Result are defined in Appendix A of that document.

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6. Order Forwarded to Subsetter: V0 Gateway to Subsetter Interface

Figure 6-1 shows a Product Request message flowing to the Subsetter from the V0 Gateway and the Product Result returned by the Subsetter.

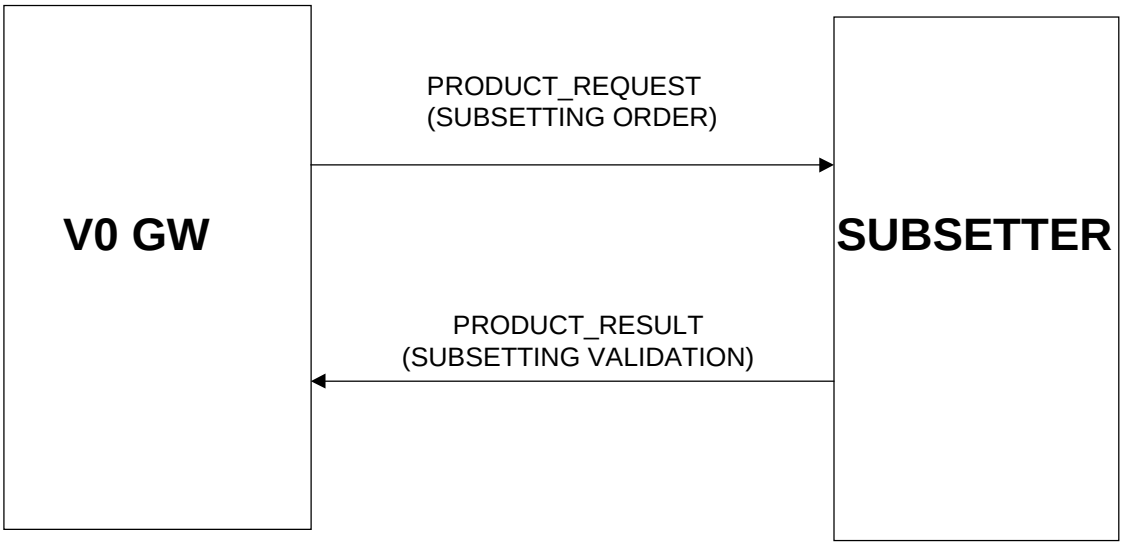

Figure 6-1. Subsetting Order to the Subsetter

6.1 Product Request

The ECS V0 Gateway sends a V0 Product Request message (Table 6-1) to forward the subsetting request to the Subsetter. It includes the Order ID and the subsetting Request ID.

The REQUEST_ID keyword in the Product Request message contains the ECS OrderID:Request ID that will be used to identify the subsetted product throughout the process. The format of the REQUEST_ID in the Product Request is “Order ID:Request ID”, where Order ID is associated with the entire order and the Request ID a subportion of the order (e.g., “15:34”, where “15” is the Order ID and “34” is the Request ID). The Order ID:Request ID provided by ECS will be a variable length alphanumeric character string whose maximum length is 20 characters. ECS guarantees that this identifier is unique.

Table 6-1. Product Request Message from V0 Gateway to the Subsetter (1 of 4)

ODL KEYWORD/GROUP	Type/Length	Comments
PRODUCT_REQUEST group ::==		
MESSAGE_ID	String 30	Generated by ECS
REQUEST_ID	String 20	Contains the ECS Order ID and Request ID stored in the MSS database in the format xxxxxx:yyyyyy
DATA_CENTER_ID	String 10	
[AUTHENTICATOR]	String 16	
[ECS_AUTHENTICATOR]	String 32	
[INITIAL_USER_KEY]	String 12	
USER_AFFILIATION group		
CONTACT_ADDRESS group		
SHIPPING_ADDRESS group		
BILLING_ADDRESS group		
LINE_ITEM group		One LINE_ITEM group is present. The line item may include multiple granules, but a single set of subsetting options is applicable to all granules in the list.
MONITOR group		
VERSION group		
USER_AFFILIATION group ::==		
CATEGORY	String 7	Permitted values are "USA" or "NOT USA"
TYPE	String 15	Permitted values are "GOVERNMENT", "COMMERCIAL", "ACADEMIC" and "OTHER"
CONTACT_ADDRESS group ::==		Except for EMAIL this can be ignored by Subsetter
[TITLE]	String 5	
LAST_NAME	String 20	
FIRST_NAME	String 20	
[MIDDLE_INITIAL]	String 1	
[ORGANIZATION]	String 60	
ADDRESS	Sequence String 32	
CITY	String 30	
[STATE]	String 20	
[ZIP]	String15	
COUNTRY	String 30	
PHONE	String 22	

Table 6-1. Product Request Message from V0 Gateway to the Subsetter (2 of 4)

ODL KEYWORD/GROUP	Type/Length	Comments
[FAX]	String 22	
EMAIL	String 128	The e-mail address of the requesting user. The subsetter may exercise an option to send status information directly to the user.
SHIPPING_ADDRESS group ::==		Can be ignored by Subsetter unless Subsetter delivers files itself
[TITLE]	String 5	
LAST_NAME	String 20	
FIRST_NAME	String 20	
[MIDDLE_INITIAL]	String 1	
[ORGANIZATION]	String 60	
ADDRESS	Sequence String 32	
CITY	String 30	
[STATE]	String 20	
[ZIP]	String 15	
COUNTRY	String 30	
PHONE	String 22	
[FAX]	String22	
EMAIL	String 128	
BILLING_ADDRESS group ::==		Can be ignored by Subsetter
[TITLE]	String 5	
LAST_NAME	String 20	
FIRST_NAME	String 20	
[MIDDLE_INITIAL]	String 1	
[ORGANIZATION]	String 60	
ADDRESS	Sequence String 32,	
CITY	String 30	
[STATE]	String 20	
[ZIP]	String 15	
COUNTRY	String 30	
PHONE	String 22	
[FAX]	String 22	
EMAIL	String 128	
LINE_ITEM group ::==		

Table 6-1. Product Request Message from V0 Gateway to the Subsetter (3 of 4)

ODL KEYWORD/GROUP	Type/Length	Comments
DATASET_ID	String 85	Describes the granule(s) to be subsetted.
PACKAGE_ID	Sequence String 50	Contains the granule ID of the granule to be subsetted. May contain multiple granule IDs if they have the same subsetting options.
PROCESSING_OPTIONS	String 30	
MEDIA_TYPE	String 20	
MEDIA_FORMAT	String 30	
[ORDER_SPEC]		Used to convey distribution information for ftp deliveries. See example in Figure 6-2b.
[SUBSET_SPEC group]		
[ADDITIONAL_INFO]		
EST_COST		Can be ignored by Subsetter
SUBSET_SPEC group ::==		
(SPECIALIZED_CRITERIA group)+		
SPECIALIZED_CRITERIA group ::==		How this group is used depends on the subsetting options requested; see Figure 6-2 for examples. Total GRANULE_SIZE for the request is supplied in a SPECIALIZED_CRITERIA group.
[CRITERIA_MAX]	Real, integer or date, 30	
[CRITERIA_MIN]	Real, integer or date, 30	
CRITERIA_NAME	String 256	
[CRITERIA_TYPE]	String 7	
[CRITERIA_VALUE]	Real, date or integer sequence or string, 128	
[POINT_LOC group | POLYGON_LOC group | RANGE_LOC group]		
POINT_LOC group ::==		
LATITUDE	Real 8	
LONGITUDE	Real 9	

Table 6-1. Product Request Message from V0 Gateway to the Subsetter (4 of 4)

ODL KEYWORD/GROUP	Type/Length	Comments
POLYGON_LOC group ::==		
LATITUDE	Real 8	
LONGITUDE	Real 9	
[MAP_PROJECTION_TYPE]	String 80	
[POLE_INCLUDED]	Symbol 1	
[TANGENT_LATITUDE]	Real 8	
[TANGENT_LONGITUDE]	Real 9	
RANGE_LOC group ::==		
EAST_LONGITUDE	Real 9	
NORTH_LATITUDE	Real 8	
SOUTH_LATITUDE	Real 8	
WEST_LONGITUDE	Real 9	
MONITOR group ::==		
TX_CLIENT	Sequence String 20	
[RX_SERVER]		
[TX_SERVER]		
[RX_CLIENT]		
[SESSION_ID]		
VERSION group ::==		
PROTOCOL_VERSION	Real 10	
SENDER_VERSION	String 16	
[IMS_STAFF]	String 10	

For each request, there is a LINE_ITEM group containing the SUBSET_SPEC. See Figure 6-2a for an example of the SUBSET_SPEC content. The SUBSET_SPEC applies to all granules in the Request.

The Granule Size is the total of the granule sizes in the Request. It is given in Megabytes, i.e., the number of bytes in the granule(s) divided by 1,000,000.

The "Parameter" Specialized Criteria group is the list of data fields that are to be subset spatially.

The "Also_Include" Specialized Criteria group is a list of fields that cannot be subset (spatially) but can be extracted in whole from the file and included with those fields that are subset.

The RANGE_LOC group outside of the SUBSET_SPEC group is the granule extent, not a subsetting instruction.

Figure 6-2b shows an excerpt of the Request in Figure 6-2a with the Media Type changed to FtpPush. The necessary FtpPush instructions are conveyed by inserting an ORDER_SPEC group.

The definitions of the keywords for the Product Request message are provided in Appendix A of the ECS-V0 ICD.

```
GROUP = PRODUCT_REQUEST
        MESSAGE_ID = "0"
        REQUEST_ID = "PENDING"
        DATA_CENTER_ID = "GSFC-ECS"
        DORRAN_USERNAME = "subsetter"
        GROUP = LINE_ITEM
                DATASET_ID = "MODIS/Terra Aerosol 5-Min L2 Swath 10km V001"
                PACKAGE_ID = "SC:MOD04_L2.001:1249170"
                PROCESSING_OPTIONS = "NativeGranule"
                MEDIA_TYPE = "8MM"
                MEDIA_FORMAT = "TARFORMAT"
                EST_COST = 0.00
                GROUP = SUBSET_SPEC
                        GROUP = SPECIALIZED_CRITERIA
                                CRITERIA_NAME = "Granule_size"
                                CRITERIA_TYPE = "FIXED"
                                CRITERIA_VALUE = ("32.236000")
                        END_GROUP = SPECIALIZED_CRITERIA
                        GROUP = SPECIALIZED_CRITERIA
                                CRITERIA_NAME = "Parameter"
                                CRITERIA_TYPE = "STRING"
                                CRITERIA_VALUE = (
                                        "Scan_Start_Time",
                                        "Solar_Zenith",
                                        "Solar_Azimuth",
                                        "Sensor_Zenith",
                                        "Sensor_Azimuth",
                                        "Reflected_Flux_Land",
                                        "Transmitted_Flux_Land",
                                        "Cloud_Fraction_Land",
                                        )
                        END_GROUP = SPECIALIZED_CRITERIA
                        GROUP = SPECIALIZED_CRITERIA
                                CRITERIA_NAME = "Also_include"
                                CRITERIA_TYPE = "STRING"
                                CRITERIA_VALUE = (
                                        "Solution_1_Land",
                                        "Solution_2_Land",
                                        "Solution_3_Land",
                                        "MODIS_Band_Land",
                                        )
                        END_GROUP = SPECIALIZED_CRITERIA
                        GROUP = RANGE_LOC
                                NORTH_LATITUDE = 35.0000
```

```
                    SOUTH_LATITUDE = 34.0000
                    WEST_LONGITUDE = -80.0000
                    EAST_LONGITUDE = -79.0000
```

Figure 6-2a. Example of a Product Request to the Subsetter (1 of 2)

```
                END_GROUP = RANGE_LOC
                GROUP = SPECIALIZED_CRITERIA
                        CRITERIA_NAME = "Spatial"
                        CRITERIA_TYPE = "GEO"
                        GROUP = RANGE_LOC
                                NORTH_LATITUDE = 35.0000
                                SOUTH_LATITUDE = 34.0000
                                WEST_LONGITUDE = -80.0000
                                EAST_LONGITUDE = -79.0000
                        END_GROUP = RANGE_LOC
                END_GROUP = SPECIALIZED_CRITERIA
        END_GROUP = SUBSET_SPEC
        GROUP = RANGE_LOC
                NORTH_LATITUDE = 36.1
                WEST_LONGITUDE = -105.79
                SOUTH_LATITUDE = 15.02
                EAST_LONGITUDE = -78.27
        END_GROUP = RANGE_LOC
    END_GROUP = LINE_ITEM
END_GROUP = PRODUCT_REQUEST
```

Figure 6-2a. Example of a Product Request to the Subsetter (2 of 2)

```
    GROUP = LINE_ITEM
        DATASET_ID = "MODIS/Terra Aerosol 5-Min L2 Swath 10km V001"
        PACKAGE_ID = "SC:MOD04_L2.001:1249170"
        PROCESSING_OPTIONS = "NativeGranule"
        MEDIA_TYPE = "FtpPush"
        MEDIA_FORMAT = "FILEFORMAT"
        EST_COST = 0.00
        GROUP = ORDER_SPEC
          GROUP = SPECIALIZED_CRITERIA
            CRITERIA_NAME = "FTPHOST"
            CRITERIA_TYPE = "STRING"
            CRITERIA_VALUE = "LabHost"
          END_GROUP = SPECIALIZED_CRITERIA
          GROUP = SPECIALIZED_CRITERIA
            CRITERIA_NAME = "FTPPASSWORD"
            CRITERIA_TYPE = "STRING"
            CRITERIA_VALUE = "01Sept6A"
          END_GROUP = SPECIALIZED_CRITERIA
          GROUP = SPECIALIZED_CRITERIA
            CRITERIA_NAME = "FTPPUSHDEST"
            CRITERIA_TYPE = "STRING"
            CRITERIA_VALUE = "/devdata1/DEV08/PushArea"
          END_GROUP = SPECIALIZED_CRITERIA
          GROUP = SPECIALIZED_CRITERIA
```

```
                CRITERIA_NAME = "FTPUSER"
                CRITERIA_TYPE = "STRING"
                CRITERIA_VALUE = "labuser"
            END_GROUP = SPECIALIZED_CRITERIA
        END_GROUP = ORDER_SPEC
            .
            .
END_GROUP = LINE_ITEM
```

Figure 6-2b. Example Line Item Group for an FtpPush Order

6.2 Product Result

The Subsetter returns the ODL Product Result message shown in Table 6-2 to acknowledge receipt of a Product Request message and verify or reject the order request. The optional Request Result group can be omitted. The V0 Gateway interprets the Status Code and Status Code Comment as being associated with the RequestID furnished in the Product Request. The Status Code and Status Code Comment provided by the Subsetter, as well as the optional Subsetter URL, are returned to the User via the EDG in the Product Result for the order by the V0 Gateway (see Section 5.4).

See the ECS-V0 ICD for the entire Product Result normalization form. Definitions of the keywords for the Product Result message are provided in Appendix A of that ICD.

Table 6-2. Product Result Returned by Subsetter

Keyword/Group	Type/Length	Comment
PRODUCT_RESULT group ::==		
MESSAGE_ID	String 30	Generated by the Subsetter
DATA_CENTER_ID	Sequence String 10,	Generated by the Subsetter
STATUS_CODE	Integer 4	01 Successful query (subsetting request accepted) 99 Should be used when the Subsetter finds the request not retryable; always accompanied by STATUS_CODE_COMMENT. STATUS_CODE 99 is always transmitted to MSS Order Tracking database as "Aborted" by the V0 Gateway. If the Subsetter sends a retryable error, the request is Aborted in the MSS database. If the user retries, a new Order ID and Request ID are assigned.
[STATUS_CODE_COMMENT]	Sequence String 256	Optional comment will be returned to the user by the V0 Gateway. Use to provide reason for failure whenever STATUS_CODE 99 is sent. It is recommended that status code comments

Keyword/Group	Type/Length	Comment
		be defined in operations agreements between Subsetters and DAACs.
DAAC_CONTACT_ADDRESS group		Required. Single group only
MONITOR group		Required
[VERSION group]		
(MISC_URL group)*		By agreement with the DAAC, the Subsetter may supply a URL for user to check order status or cancel order directly . Order cancellations received from the User must be forwarded to ECS via an ORDER_STATUS_UPDATE message (see Section 11).

6.3 Error Handling

If no Product Result message is returned to the V0 Gateway by the Subsetter, or if the Product Result contains an unknown status code, the V0 Gateway aborts the Request and the user is notified in the Product Result to the EDG.

Once the Subsetter has returned a Product Result verifying the Request, it must report any failure of the Request to the V0 Gateway in an ORDER_STATUS_UPDATE message (See Section 11).

The Subsetter records all errors, whether or not they result in a request failure, in an internal log that is accessible to DAAC Operations.

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7. Subsetter Orders Input Data: Subsetter to V0 Gateway Interface

To order data from the ECS archives for subsetting, the subsetter sends a standard V0 Product Request message to the V0 Gateway (Figure 7-1).

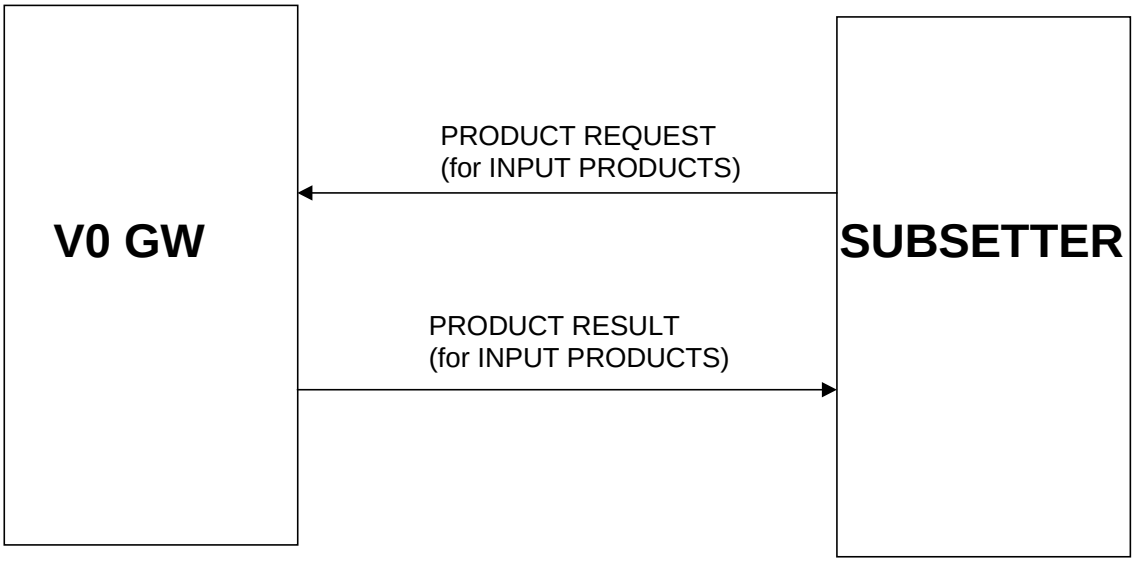

Figure 7-1. Subsetter Request for Input Data

7.1 Product Request

The DAAC should register a user profile for the subsetter, which includes subsetter contact information such as e-mail address. Delivery method, ftp push or pull, and ftp addressing information should be coordinated in advance.

To obtain input data for subsetting, the Subsetter sends a standard Product Request to the V0 Gateway. The Request contains no SUBSET_SPEC group, because the Subsetter's order is simply for ECS archived granules to be used as subsetting input. The subsetter-provided Message ID and Request ID are not related to those that were furnished by ECS in the Subsetting Order and are not significant to ECS. The Subsetter's order may contain a single line item with multiple granules or multiple line item groups. In the latter case, if the line item groups are identical except for the granule information, ECS assigns a single Request ID.

The ODL normalization form for the PRODUCT REQUEST is given in Table 7-1. Notice that the Shipping Address and Billing Address groups are unnecessary in Product Requests from the subsetter. The definitions of the keywords for the Product Request message are provided in Appendix A of the ECS-V0 ICD.

Table 7-1. Product Request Message from Subsetter to V0 Gateway (1 of 2)

ODL KEYWORD/GROUP	Type/Length	Comments
PRODUCT_REQUEST group ::==		
MESSAGE_ID	String 30	Generated by Subsetter
REQUEST_ID	String 20	
DATA_CENTER_ID	String 10	Identifier assigned by the DAAC
[AUTHENTICATOR]	String 16	
[ECS_AUTHENTICATOR]	String 32	
[INITIAL_USER_KEY]	String 12	
USER_AFFILIATION group		
CONTACT_ADDRESS group		
(LINE_ITEM group)+		At least one LINE_ITEM group is present
MONITOR group		
VERSION group		
USER_AFFILIATION group ::==		
CATEGORY	String 7	Permitted value is "USA"
TYPE	String 15	Permitted values are "GOVERNMENT", "COMMERCIAL", "ACADEMIC" and "OTHER"
CONTACT_ADDRESS group ::==		If the DAAC provided an ECS user profile for the Subsetter, this group is not needed.
[TITLE]	String 5	
LAST_NAME	String 20	
FIRST_NAME	String 20	
[MIDDLE_INITIAL]	String 1	
[ORGANIZATION]	String 60	
ADDRESS	Sequence String 32	
CITY	String 30	
STATE	String 20	
[ZIP]	String15	
COUNTRY	String 30	
PHONE	String 22	
[FAX]	String 22	

Table 7-1. Product Request Message from Subsetter to V0 Gateway (2 of 2)

ODL KEYWORD/GROUP	Type/Length	Comments
EMAIL	String 128	e-Mail address to which ECS should send the Distribution Notice for the Subsetter
LINE_ITEM group ::==		
DATASET_ID	String 85	
[PACKAGE_ID]	Sequence String 50	Contains the Granule ID(s) of the granule(s) to be subsetted. May contain multiple granule IDs
PROCESSING_OPTIONS	String 30	
MEDIA_TYPE	String 20	
MEDIA_FORMAT	String 30	
[ORDER_SPEC group]		
[ADDITIONAL_INFO]		
EST_COST		Can be left blank
MONITOR group ::==		
TX_CLIENT	Sequence String 20	
[RX_SERVER]		
[TX_SERVER]		
[RX_CLIENT]		
[SESSION_ID]		
VERSION group ::==		
PROTOCOL_VERSION	Real 10	
SENDER_VERSION	String 16	
[IMS_STAFF]	String 10	

7.2 Product Result

The ECS V0 Gateway returns a standard Product Result message (Table 7-2) to the Subsetter to acknowledge receipt of the PRODUCT REQUEST (see Section 7.1). The subsetter should check the STATUS_CODE and STATUS_CODE_COMMENT fields to make sure the Product Request was successfully submitted. Status Codes are defined in Appendix A of the ECS-V0 ICD under keyword STATUS_CODE. A good status return does not imply that the product has already been processed and shipped or even that granule availability has been checked. It refers to the Product Request as a whole and only means that the Product Request has been successfully received and accepted.

ECS provides the assigned MSS Order ID as DAAC_ORDER_ID in the DAAC_CONTACT_ADDRESS group of the Product Result. The Request ID is furnished as DAAC_REQUEST_ID in the Request Result group. If the Subsetter's order contains multiple line item groups, identical except for granule, ECS asssigns a single Request ID and combines the line item groups into a single line item in the Product Result.

The Order ID and Request ID are returned on the Distribution Notice furnished with the data delivery (see Section 8).

See the ECS-V0 ICD for the entire ODL normalization form for PRODUCT RESULT. The definitions of the keywords for the Product Result message are provided in Appendix A of that ICD.

Table 7-2. Product Result Returned by V0 Gateway to Subsetter

ODL KEYWORD/GROUP	Comment
PRODUCT_RESULT group ::==	
MESSAGE_ID	
DATA_CENTER_ID	
STATUS_CODE	For a successful order code 01 is returned. For unsuccessful orders there are a number of status codes. Some codes may indicate the order may be retryable; others that requested data cannot be provided.
[STATUS_CODE_COMMENT]	
DAAC_CONTACT_ADDRESS group	Single group only. Contains the MSS Order ID.
MONITOR group	
[VERSION group]	
[REQUEST_RESULT group]	
STATUS_CODE	
[STATUS_CODE_COMMENT]	
(MISC_URL group)*	
DAAC_REQUEST_ID	This is the MSS Request ID.
LINE_ITEM group	

7.3 Error Handling

If no Product Result message is received, the Subsetter can -

- Fail the Subsetting Request and log the failure.
- Resubmit the Product Request at configurable intervals a configurable number of times before failing the Subsetting Request.

If the Product Result is received but the status code indicates the order was not successful, the Subsetter's action should be determined by the status code. The Subsetter may retry by sending a

new Product Request for the input data or cancel the subsetting request by sending an Order Status Update with ORDER_STATUS_CODE = "Terminated" (see Section 11).

If a good Product Result response was received but no Distribution Notice or product has been received, the Subsetter has the option of submitting a new Product Request before terminating the Subsetting Request by logging the failure and sending Terminated status to the V0 Gateway.

If product distribution is successful but the product received is not usable for some reason, the Subsetter should terminate the Subsetting Request.

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8. Delivery of Input Data from ECS Data Distribution to the Subsetter

ECS delivers input data ordered by the Subsetter using its standard data distribution procedures and e-mail Distribution Notice message (Figure 8-1). For a description of this interface, including the specification for the e-mail distribution notice, see the ECS-SIPS ICD, Volume 0, Interface Mechanisms, Section 4.3.

Depending on the DAAC and the particular Subsetter, either the ECS FtpPush or FtpPull distribution option is used. Actual node and path for the ftp delivery and the e-mail address for the notification should be maintained in a DAAC operational document.

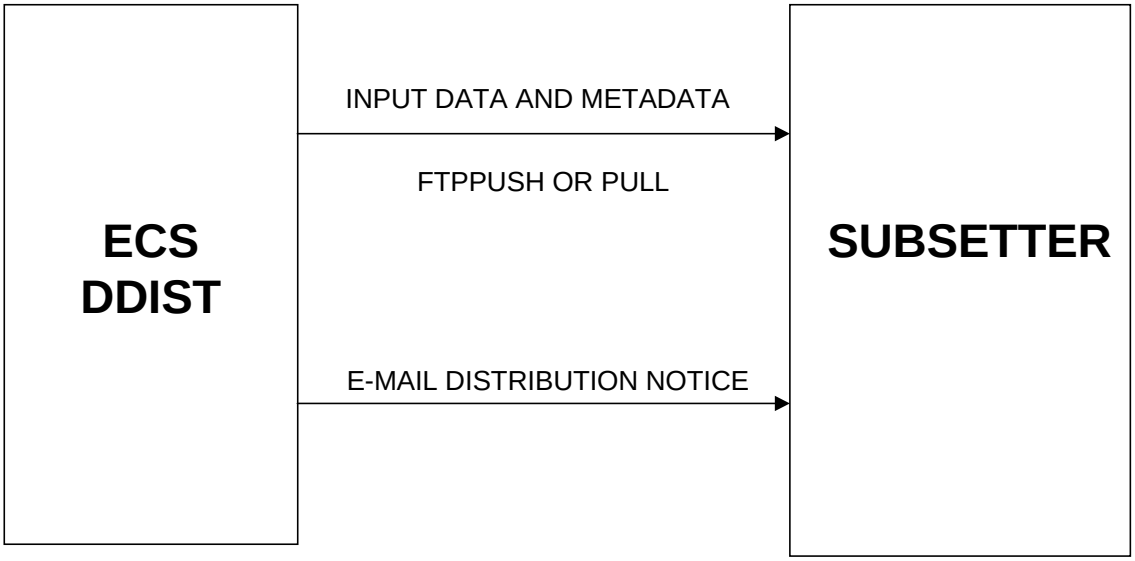

Figure 8-1. ECS Distribution of Input Data to the Subsetter

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9. Transfer of Subsetted Product from Subsetter to ECS Data Distribution

9.1 Overview

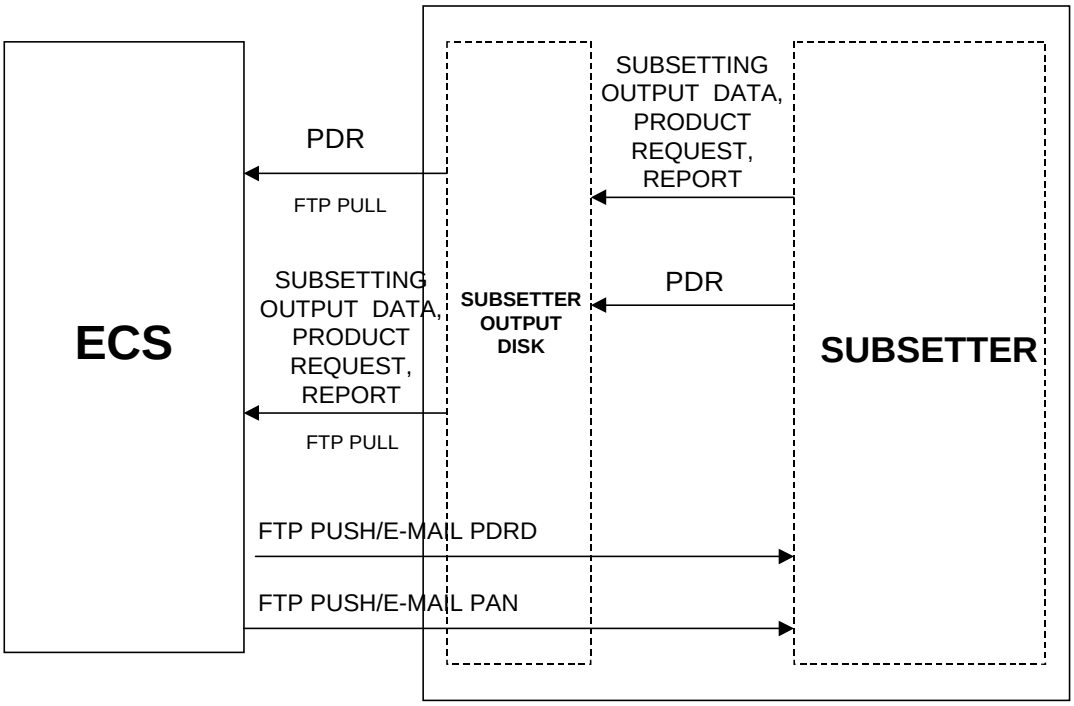

Figure 9-1. Interface for ECS Ingest of Subsetted Data

If subsetted data for a Request is to be distributed by the ECS rather than the Subsetter itself, the Subsetter transfers the data to the ECS via a polling with delivery record interface. Since the subsetted data is not ingested into the ECS, no ESDTs are registered for the subsetted data and no metadata files are required. Figure 9-1 summarizes the polling with delivery record interface.

The subsetter places all files to be delivered on its output disk; then in a pre-determined directory places a Product Delivery Record (PDR) file that identifies all files to be transferred and specifies their location. The ECS polls the PDR directory at configurable intervals. When it finds a new PDR, it parses the PDR. If discrepancies are found, the ECS notifies the Subsetter via a Product Delivery Record Discrepancy (PDRD) file. To recover from the PDRD the Subsetter may delete the PDR and the data it references and restage the data and a corrected PDR. Whenever the ECS finds a clean PDR, it picks up all the files specified on the PDR and notifies the Subsetter of the success or error status for each file via a Production Acceptance Notification (PAN) file. The Subsetter may then delete the files from its output disk.

The Product Request message originally supplied to the Subsetter by the V0 Gateway must be converted to a text file and included on the PDR. ECS uses that file to obtain the Request ID and distribution instructions for the request.

ECS returns the PDRD and PAN via e-mail. Node and directory path for the Subsetter's PDR server and the e-mail address for ECS responses should be documented in a DAAC operational document. Procedures for error recovery should also be maintained in operational documentation as different Subsetters may use different error recovery options.

9.2 Files Provided by the Subsetter

For each Request ID, the Subsetter supplies four categories of files: subsetting output files supplied either individually or in Tar files, Product Request, subsetting report, and Product Delivery Record. These categories are defined in Table 9-1. The Product Delivery Record (PDR) identifies the other files that are being provided to fill the request. The format of the PDR is defined in Section 9.3. The file naming convention for these files is given in Table 9-2. If the subsetting output files are not tar'd, native file names are retained.

Table 9-1. Types of Files Delivered to ECS by Subsetter

File	File Extension	No. of files	Description
Native subsetting output files	Any file name extension may be used except: .REQ, .REPT, .PDR, .TAR	1 or more	The subsetting output may include other artifacts such as original metadata or data from the ECS archive that failed processing.
Tar file	.TAR	1 or more	The Subsetting output files may be tar'd.
Product Request file	.REQ	1	A text file consisting solely of the text of the ODL Product Request message originally furnished to the Subsetter by the V0 Gateway (see Section 6.1). The Product Request provides the Request ID and distribution instructions that ECS needs to make the delivery. ECS will fail the transfer if no Product Request is included on the PDR.
Subsetting Report File	.REPT	1	A text file containing the subsetter's report of the subsetting operation. It contains information about processing results and failures.
Product Delivery Record (PDR)	.PDR	1	A PVL file identifying the files, with their location, that are being provided to the ECS by the Subsetter for distribution. A separate PDR is supplied for each Request ID.

Table 9-2. Naming Convention for Tar, Product Request, Subsetting Report and PDR Files

Field	Description	Format/ Type Max Size (Bytes)	Value
Subsetter Designation agreed on with DAAC	Must begin with a Subsetter-Unique identifier meaningful to DAAC operators	ASCII String (max 30)	[Free text]
PDR Creation Date	Creation date and time of PDR file. If a PDR is resubmitted, the creation date must be updated.	ASCII (15)	.yyyymmddhhmmss
File sequence number	Required for Tar files only. Assigns a sequential number to each tar file to ensure uniqueness of tar file names on a single PDR	ASCII (3)	*_nn*
Filename extension	Extension identifies type of file per Table 9-1 (required)	ASCII String (max 5)	[per Table 9-1]

9.3 Product Delivery Record

Table 9-3 is the specification for the Product Delivery Record (PDR) file. The Subsetter must supply a separate PDR for each subsetting Request to be delivered by ECS Distribution. All files related to the Request ID are submitted as a single FILE_GROUP on the PDR. For each Subsetter, the ORIGINATING_SYSTEM parameter on the PDR must be agreed on with the DAAC and used consistently. The DATA_TYPE value is always "SBSTDATA".

All associated data files must be placed on the Subsetter's output disk before the PDR is written to the pre-determined directory.

Table 9-3. Product Delivery Record PVL Parameters

Parameter	Description	Type	Format/ Max Size (Bytes)	Value
ORIGINATING_SYSTEM	Originator of Delivery Record. Identifier for the Subsetter.	Variable String	ASCII (20 B)	Free text, e.g. 'HEW_GSFC' (not an IP address)
TOTAL_FILE_COUNT	Total number of files listed on the PDR for transfer	Integer	ASCII (4 B)	1-9999
EXPIRATION_TIME	Subsetter-designated ISO time for deletion of data from the Subsetter's output disk if ECS does not respond to the PDR.	Fixed String	ASCII (20 B)	GMT in the format: yyyy-mm-ddThh:mm:ssZ, where T indicates the start of time information and Z indicates "Zulu" time
OBJECT	Start of file group parameters. There is only one file group, which contains all files for a single Request.	Fixed String	ASCII (10 B)	'FILE_GROUP'
DATA_TYPE	Data type identifies the PDR as transferring externally subsetted data for delivery to a user. It is not a registered ESDT short name.	Variable String	ASCII (8 B)	Always 'SBSTDATA'
NODE_NAME	Name of network node on which the files in the file group are staged for pickup.	Variable String	ASCII (64 B)	Name or IP address
OBJECT	Start of file parameters for a single file. Only one file per FILE_SPEC object.	Fixed String	ASCII (9 B)	'FILE_SPEC'
DIRECTORY_ID	File directory location (i.e., a path name)	Variable String	ASCII (See Note 1)	Directory path (not including file name)
FILE_ID	File name of tar,request, report or native subsetting output file	Variable String	ASCII (See Note 1)	File name
FILE_SIZE	Length of file in bytes	Unsigned 32 bit Integer	ASCII (10 B)	< 2 GB
END_OBJECT	End of file specification. Repeat for each file.	Fixed String	ASCII (9 B)	'FILE_SPEC'
END_OBJECT	End of parameters for files in the Request	Fixed String	ASCII (10 B)	'FILE_GROUP'

Note 1. Size does not exceed 256 B when DIRECTORY_ID and FILE_ID are combined.

9.4 Product Delivery Record Discrepancy

ECS parses the PDR file and returns a Product Delivery Record Discrepancy (PDRD) if errors in the file format are found. After the PDRD is returned, the Subsetter deletes all files associated with the request. To obtain a successful distribution, the Subsetter must provide a new PDR and restage the data files. If no errors are found, ECS proceeds with the file transfer process.

There are two variations on the PDRD, short and long. The short form is used when the first error encountered in each file group within the PDR is the same or the first error found applies to each group. The long form is used when one or more file groups in the PDR have invalid parameters; some file groups may be error-free. Table 9-4 is the specification for a short Product PDRD file; Table 9-5, for a long PDRD.

Table 9-4. Short Product Delivery Record Discrepancy PVL Parameters

Parameter	Description	Type/Format (Length in Bytes)	Value
MESSAGE_TYE	Short Product Delivery Record Discrepancy	Fixed String/ASCII (9)	SHORTPDRD
DISPOSITION	Disposition of Ingest Request[1]	Variable String/ASCII (64)	One of the following: "INVALID FILE COUNT" "ECS INTERNAL ERROR" "INVALID PVL STATEMENT" "MISSING OR INVALID ORIGINATING_SYSTEM PARAMETER" "DATA PROVIDER REQUEST THRESHOLD EXCEEDED"

Note 1. In any given instance, only one disposition value is provided. In cases where multiple errors may exist, the disposition value corresponding to the first error encountered will be provided.

Table 9-5. Long Product Delivery Record Discrepancy PVL Parameters

Parameter	Description	Type/Format (Length in Bytes)	Value
MESSAGE_TYPE	Long Product Delivery Record Discrepancy	Fixed String/ASCII (8)	LONGPDRD
NO_FILE_GRPS (to follow)	Number of File Groups in the PDR	Integer/ASCII (4)	Number of File Groups in the PDR
DATA_TYPE	DATA_TYPE in PDR	ASCII String (20)	SBSTDATA
DISPOSITION	Disposition of Ingest Request[1]	Variable String/ASCII (64)	One of the following: "INVALID DATA TYPE" * "INVALID DIRECTORY" * "INVALID FILE SIZE" "INVALID FILE ID" * "INVALID NODE NAME" * "INVALID FILE TYPE" *

Note 1. Only one disposition value may be provided. In cases where multiple errors may exist, the disposition value corresponding to the first error encountered will be provided.

* Null string check only

9.5 Product Acceptance Notification

When the file transfer process is completed, ECS returns a Product Acceptance Notification (PAN) which confirms successful receipt or failure for each file. The PAN may be furnished in short (Table 9-6) or long (Table 9-7) form.

Table 9-6. Short Production Acceptance Notification PVL Parameters

Parameter	Description	Type/Format (Length in Bytes)	Value
MESSAGE_TYPE	Short Production Acceptance Notification Definition	Fixed String/ASCII (8)	SHORTPAN
DISPOSITION	Disposition of Ingest Request[1]	Variable String/ASCii (64)	One of the following: "SUCCESSFUL" [3] "ECS INTERNAL ERROR" [4]
TIME_STAMP 2	ISO Time when the ECS completed transfer of the file. Does not necessarily indicate successful ingest.	ASCII (20)	GMT in the format: yyyy-mm-ddThh:mm:ssZ, where T indicates the start of time information and Z indicates "Zulu" time

Note 1. In any given instance, only one disposition value may be provided. In cases where multiple errors have occurred, the disposition value corresponding to the first error encountered will be provided.
Note 2. The time stamp is present only in certain circumstances. If the time stamp is null, the value will be 20 spaces (character 20 hex). See the footnotes on the values for "Disposition" to determine when the time stamp is null.
Note 3. Dispositions for which there will always be a time stamp.
Note 4. Dispositions for which the time stamp is sometimes null, i.e., when the file has not been ftp'd.

Table 9-7. Long Production Acceptance Notification PVL Parameters

Parameter	Description	Type/Format (Length in Bytes)	Value
MESSAGE_TYPE	Long Production Acceptance Notification	Fixed String/ASCII (7)	LONGPAN
NO_OF_FILES	Number of Files in PDR	ASCII (4)	TOTAL_FILE_COUNT parameter in PDR
For each File in the PDR			
FILE_DIRECTORY	ASCII string specifying file directory location	ASCII (<256) Equivalent to PDR length	DIRECTORY_ID parameter in PDR
FILE_NAME	File names on system creating PDR	ASCII (<256) Equivalent to PDR length	FILE_ID parameter in PDR
DISPOSITION	Disposition of Ingest Request [1]	Variable String/ASCII (64)	One of the following: "SUCCESSFUL"[3] "ALL FILE GROUPS/FILES NOT FOUND"[4] "ECS INTERNAL ERROR"[5] "INCORRECT NUMBER OF FILES"[3]
TIME_STAMP[2]	ISO Time when the ECS completed transfer of the file. Does not necessarily indicate successful ingest.	ASCII (20)	GMT in the format: yyyy-mm-ddThh:mm:ssZ, where T indicates the start of time information and Z indicates "Zulu" time.

Note 1. In any given instance, only one disposition value may be provided. In cases where multiple errors have occurred, the disposition value corresponding to the first error encountered will be provided.
Note 2. The time stamp is present only in certain circumstances. If the time stamp is null, the value will be 20 spaces (character 20 hex). See the footnotes on the values for "Disposition" to determine when the time stamp is null.
Note 3. Dispositions for which there will always be a time stamp.
Note 4. Dispositions for which the time stamp will always be null.
Note 5. Dispositions for which the time stamp is sometimes null, i.e., when the file has not been ftp'd.

9.6 Error Handling

To recover from a failure to transfer any file in a delivery, the Subsetter must submit a new PDR. When the Subsetter receives a PDRD or a PAN with recoverable errors, it can delete the PDR and all the associated files on the output disk; then submit a new PDR following the full process in Section 9.1. Alternatively, if the problem is not with the files being transferred, it can delete the PDR, rename the associated files and submit a new PDR pointing to the renamed files.

If the Subsetter places a PDR in the pre-determined directory but receives no PDRD or PAN, it should wait a configurable interval before logging an error. The interval should be based on the assumption that the ECS server is down and it is unlikely that recovery will be a matter of seconds or even a few minutes.

Note: If the Subsetter continues to place new deliveries on the output disk without checking disk space, the disk may fill up while waiting for ECS responses to resume.

For a particular Subsetter, it may be appropriate to turn certain problems over to Operations. There is an MSS Order Status code "Operator Intervention" that can be used to alert Operations personnel that operator invention is needed. The Subsetter can supply this status in an ORDER_STATUS_UPDATE message to the V0 Gateway. If this avenue is taken, the failed PDR and files could be moved from the Subsetter output disk and held in another location for operator analysis.

If the transfer of subsetted data fails and recovery cannot be achieved, the Subsetter sends an Order Status Update message with status Terminated to the V0 Gateway (see Section 11).

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10. Delivery of Subsetted Product Order from ECS Data Distribution to Science User

Whenever the Subsetter furnishes subsetted data to ECS for delivery to the user, ECS automatically delivers the subsetted data files via FTP Push or Pull and sends an e-mail Distribution Notice to the User. For specifications for the ECS Distribution Notice, see the ECS-SIPS ICD, Volume 0, Interface Mechanism, Section 4.3, but note that for subsetting requests, only the files listed here in Figure 10-1 are delivered.

Names of the files containing the subsetted granules as well as file names of the report files are those supplied by the Subsetter in accordance with Tables 9-1 and 9-2. The OrderID and RequestID on the Distribution Notice identify the original ECS order and subsetting request as stored in the MSS Order Tracking Database.

Note: To obtain order status, the user should query DAAC User Services, as status of a subsetted data request cannot be obtained through an EDG query.

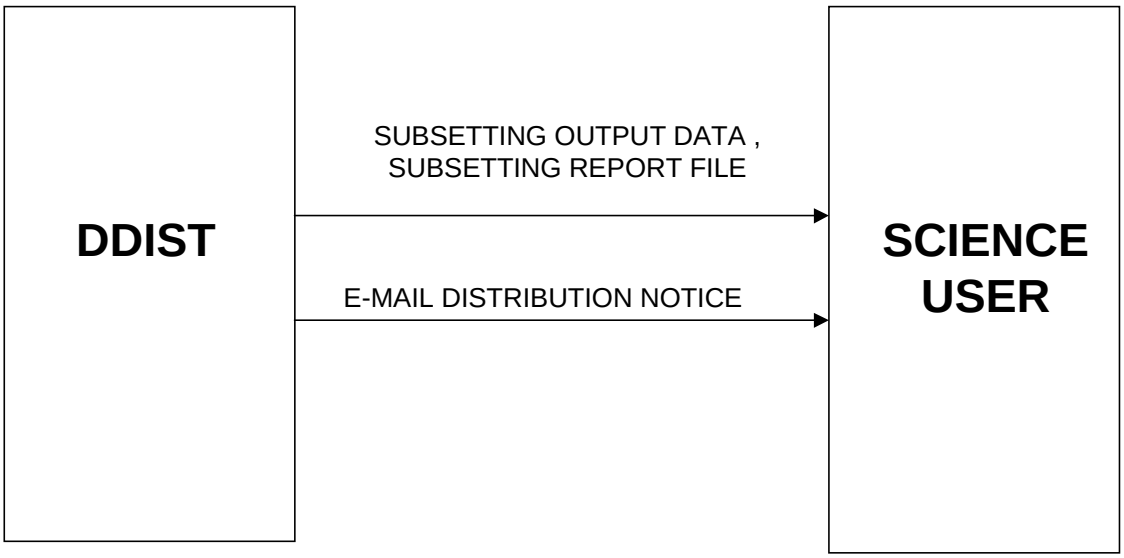

Figure 10-1. ECS FTP Push Distribution of Subsetted Data

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11. Integrated Order Status: Subsetter to V0 Gateway

11.1 ECS Order Status Codes

When the Subsetter sends a Product Result indicating that it has validated the Product Request, the V0 Gateway updates the request status in the MSS Order Tracking database from Null to Pending. If the Subsetter cannot validate the Product Request, it sends an error in the Product Result and, whether or not the request is retryable, the V0 Gateway changes the request status from Null to Aborted and returns failure information to the user via a Product Result to the EDG. (See Table 6-2.)

For each Request received and validated, the Subsetter supplies a subsetting status message (ORDER_STATUS_UPDATE) to ECS via theV0 Gateway for each of the states defined in Table 11-1.

Table 11-1. Order Status Codes

Code	Description
Canceled	Order was canceled by the User (Used only if the Subsetter provides the capability to receive cancellations directly from the user.)
Waiting for data	Subsetter is waiting for input data from ECS
Being processed	Subsetting request is being processed by the Subsetter.
Completed processing	Used only if the Request is to be shipped by the ECS. Sent by Subsetter when subsetting is completed and the products have been successfully forwarded to the ECS.
Operator Intervention	Can be sent when operator intervention might conceivably avoid terminating the subsetting request
Terminated	The Validated Request could not be completed
Shipped	Sent only when the Request is shipped by the Subsetter

The V0 Gateway reports each status to the ECS Order Tracking database. DAAC User Services can report the Subsetting Order Status to the user upon request.

11.2 Order Status Messages

The Order Status interchange between the Subsetter and the ECS uses message forms and keywords defined specifically for this interface. The Subsetter sends an ORDER_STATUS_UPDATE message (see Table 11-2) to the V0 Gateway whenever a transition to a status listed in Section 11.1 above occurs. The Gateway returns an ORDER_STATUS_ACKNOWLEDGE (Table 11-3) and ECS updates its Order Tracking Database. The status information in the Order Status Update is not forwarded to the user, but the user can request order status information from DAAC User Services.

Most of the keywords for the Order Status Update and Order Status Acknowledge messages are provided in Appendix A of the ECS-V0 ICD, but four exceptions, are defined only in Appendix B of this ICD, namely, ORDER_STATUS_UPDATE, ORDER_STATUS_ACKNOWLEDGE, ORDER_STATUS_CODE and ORDER_STATUS_COMMENT.

11.3 Error Handling

In most cases, if the Subsetter does not receive acknowledgment of its ORDER_STATUS_UPDATE message, it can log the error, but continue with processing, as this error is unlikely to affect production and distribution of the product.

Table 11-2. Order Status Update ODL

Keyword/Group	Type/Length	Comment
ORDER_STATUS_UPDATE group ::==		
DATA_CENTER_ID	Sequence String, 10	
MESSAGE_ID	String, 30	Message identifier generated by the Subsetter
REQUEST_ID	String, 30	This contains the ECS Order Id and Request Id in the format xxxxxx:yyyyyy
ORDER_STATUS_CODE	String, 30	Per Section 11.1
[ORDER_STATUS_COMMENT]	Sequence String, 256	Description of the Subsetting Request status update.
MONITOR group		
VERSION group		
MONITOR group ::==		
TX_CLIENT	Sequence String, 20	time stamp

Table 11-3. Order Status Acknowledge ODL

Keyword/Group	Type/Length	Comment
ORDER_STATUS_ACKNOWLEDGE group ::==		
MESSAGE_ID	String, 30	Message identifier supplied by the Subsetter
REQUEST_ID	String, 30	This contains the ECS Order Id and Request Id in the format xxxxxx:yyyyyy
STATUS_CODE	String, 30	
STATUS_CODE_COMMENT	Sequence String, 256	
MONITOR group		
VERSION group		
MONITOR group ::==		
TX_CLIENT		
RX_SERVER		
TX_SERVER		
VERSION group ::==		
PROTOCOL_VERSION		
SENDER_VERSION		
[IMS_STAFF]		

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Appendix A. Work-Off Plan for Open Issues and Actions

Item No.	ICD Location	Priority	Description	Actionee	Resolution
1	Section 4	A	Add subsetter characterization tool spec	ECS	
2	Table 9-1, Product Request	B	Include file format in ICD	ECS	
3	Section 11	B	Supply list of legal STATUS_COMMENT for Order Status Acknowledgement	ECS: Doug Newman	

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Appendix B. ODL Keywords Not in ECS-V0 ICD

The following keywords are not in the ECS-V0 ICD and are recognized by ECS for External Subsetter support only (see Section 11).

Keyword: ORDER_STATUS_UPDATE
Synopsis: Provides the status of the order.
Parent Group(s): Not Used
Child Group(s): MESSAGE_ID, DATA_CENTER_ID, REQUEST_ID, MONITOR, VERSION, ORDER_STATUS_CODE, ORDER_STATUS_COMMENT
ODL Type: Aggregate

Keyword: ORDER_STATUS_ACKNOWLEDGE
Synopsis: Provides the acknowledgement to the status update of an order.
Parent Group(s): Not Used
Child Group(s): MESSAGE_ID, STATUS_CODE, STATUS_CODE_COMMENT, MONITOR, VERSION
ODL Type: Aggregate

Keyword: ORDER_STATUS_CODE
Synopsis: Provides the status for a order status request.
Parent Group(s): ORDER_STATUS_UPDATE
Child Group(s): Not used
ODL Type: String
Possible Value(s): Canceled|Waiting for data|Being processed|Completed processing|Terminated|Shipped
Maximum Length: 20

Keyword: ORDER_STATUS_COMMENT
Synopsis: Ancillary information concerning an order's status.
Parent Group(s): ORDER_STATUS_UPDATE
Child Group(s): Not used
ODL Type: String
Maximum Length: 128

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Appendix C. DAAC-Subsetter Options and Configurable Parameters

Table C-1 lists various configurable parameter settings and other information that DAAC Operations and the Subsetter provider should agree on and document in advance of subsetter operations. This may not be a complete list.

Table C-1. Configurable Parameters and Options (1 of 2)

Parameter/Option	Description	ICD section
Node/port/socket	Information needed for message interchange between V0 Gateway and the Subsetter	NA
User Profile	Create User Profile for Subsetter, to be applied when Subsetter orders input data from the ECS. Contains e-mail address for the Distribution Notice and distribution location for ordered products.	Sect. 7.1
ECS Registry population	Subsetter defines subsetting options it can support for candidate ESDTs	Sect. 4
Subsetting status	The Subsetter may elect to send status-information to directly to the user via e-mail to the address provided in the Product Request	Table 6-1
URLs	Subsetter can furnish URL(s) for its status page in the Subsetter's Product Result message. The V0 Gateway will forward to user via the EDG.	Table 6-2
Method of delivery of input data to Subsetter	Coordinate whether ftp push or pull and determine ftp addresses	Sect. 7
DATA_CENTER_ID	Assign DATA_CENTER_ID to Subsetter for use in Subsetter's Product Requests	Table 7-1

Table C-1. Configurable Parameters and Options (2 of 2)

Parameter/Option	Description	ICD section
Subsetted product deliveries	Subsetter may deliver subsetted products directly to the user or elect for ECS to deliver	Sections 9, 11.1
Tar'd subsetter products	For subsetting product delivery by ECS, the Subsetter has the option of providing tar'd subsetting product files or providing the original subsetting product files	Section 9.2
Polling interval	The ECS PDR polling interval is configurable	Sect. 9.1
Method of delivering PDRD and PAN to Subsetter	May be either e-mail or ftp	Sect. 9.1
ORIGINATING_SYSTEM	Identifies the Subsetter on the Product Delivery Record	Table 9-3
Subsetter Output Disk	Define Node, directory path where subsetter places data files for ECS to retrieve and distribute	Sect. 9.1
Subsetter PDR Directory	Define Node, directory path where subsetter places PDR file for ECS to retrieve	Sect. 9.1

Abbreviations and Acronyms

DAAC	Distributed Active Archive Center
ECS	EOSDIS Core System
EDG	EOS Data Gateway
ESDT	Earth Science Data Type
FTP	File Transfer Protocol
IP	Internet Protocol
ODL	Object Description Language
PDR	Product Delivery Record
PDRD	Product Delivery Record Discrepancy
PAN	Production Acceptance Notification
PVL	Parameter Value Language
SIPS	Science Investigator-led Processing System
TCP	Transmission Control Protocol

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